

carried out in the University. The research may be in any branch of chemistry. The dissertation, with the details of the research, must be sent to the professor of chemistry not later than the division of the Easter term, 1909.

LIVERPOOL.—At the graduation ceremony on July 11 the honorary degree of LL.D. will be conferred upon Sir John Brunner, Principal Macalister, and Prof. Vinogradoff; of D.Sc. upon Mr. Francis Darwin and Prof. J. L. Todd; and of D.Eng. upon the Hon. C. A. Parsons.

MANCHESTER.—On the occasion of the installation of Viscount Morley of Blackburn as Chancellor of the University, on July 9, the honorary degree of Litt.D. will be conferred upon Mr. A. J. Evans, F.R.S., of D.Sc. upon Prof. Baldwin Spencer, F.R.S., and Prof. A. Gamgee, F.R.S., and of M.A. upon Mr. William Burton, for his scientific investigations and art productions in pottery. H.M. Treasury has allowed the grant of 12,000*l.* to remain at that figure for another year instead of reducing it to 10,000*l.* It is hoped that the grant will be continued on the higher basis, and possibly increased.

OXFORD.—Dr. B. P. Grenfell has been appointed extraordinary professor of papyrology.

The Rolleston memorial prize for 1908 has been awarded to Mr. C. C. Dobell, Trinity College, Cambridge; Mr. W. K. Spencer and Mr. C. H. G. Martin, B.A., both of Magdalen College, Oxford, were honourably mentioned by the examiners.

The Romanes lecture for 1908 will be delivered by Canon Scott Holland in the Sheldonian Theatre on Saturday, June 13, at 5 p.m. The subject of the lecture is "Bishop Butler."

The Robert Boyle lecture was delivered by Prof. Rutherford on Friday, June 5, in Balliol College Hall, the subject of the lecture being "The Transformation of Radio-active Matter."

A **CONVERSAZIONE** will be held at the East London College (University of London) on Wednesday next, June 17. The college departments will be open from 8 to 9.30 p.m.

A **SHAW** studentship for research, the gift of Mrs. Bernard Shaw, of the value of 100*l.* a year for two years, will be awarded in July by open competition at the London School of Economics and Political Science, Clare Market, W.C. Particulars of the scholarship can be obtained from the director of the school.

THE Bill "to make further provision with respect to the University of Durham" has now been printed. It proposes to appoint a body styled the University of Durham Commissioners. These Commissioners are to hold office until the end of 1909, but their powers may be continued by the King in Council, but not beyond the end of 1911. Their powers are to make statutes regulating the constitution of the University and the powers and duties of its authorities and constituent bodies and the disposition of its property in accordance with a scheme scheduled as an appendix to the Bill. Provision is made for the affiliation to the University in the faculty of science of the Sunderland Technical College, subject to its satisfying the conditions specified by the Senate of the University. The Senate is to consist of thirty-seven persons, namely, the Chancellor, six persons nominated by the Crown, the Dean and Chapter of Durham, together with so many other persons appointed by the council of the Durham colleges as shall make six in all, six appointed by such professors, tutors, and lecturers of the Durham division of the University as are not members of the Chapter, four appointed by the College of Medicine, Newcastle, four by the council of Armstrong College, and four by the professors of Armstrong College, and six appointed by Convocation, three being past students of the Durham division and three past students of the Newcastle division. Full powers are assigned to the Senate over the property, conditions of study, examinations, and degrees of the University. The Newcastle division of the University is to consist of the University College of Medicine and Armstrong College, Newcastle, but no council is set up for this division.

THE twenty-eighth annual report of the council of the City and Guilds of London Institute, dealing with the work of 1907, has now been published. The reports of the dean of the Central Technical College, of the principal of the Finsbury Technical College, of the South London Technical Art School, and of the department of technology constitute important appendices. The total income of the institute for 1907 amounted to 46,036*l.*, as compared with 44,848*l.* in 1906. A table showing the amount of the donations and subscriptions to the funds of the institute since its foundation provides much interesting information. In 1878 the total amount of such donations and subscriptions was 12,102*l.*, while in 1907 the amount reached 22,343*l.*, a gratifying increase of more than 10,000*l.* Since its foundation the institute has received from this source the large sum of 778,365*l.*, to which the table shows there have been fifty-three contributors. The largest total benefactions received in the period mentioned are from the Goldsmiths' Company, 135,314*l.*; the Fishmongers' Company, 112,270*l.*; the Clothworkers' Company, 111,750*l.*; the Mercers' Company, 75,000*l.*; the Drapers' Company, 51,500*l.*; the Skinners' Company, 50,862*l.* Previous reports of the council have directed attention to causes which impede progress in the technical instruction of artisans, and in the report on the department of technology this year the matter is referred to again. The impediments which continue to exist are, first, the difficulty of finding competent teachers, and, secondly, the unduly large proportion of artisan students who enter technical classes without the preliminary knowledge necessary to take full advantage of the instruction they receive. We have referred on many occasions in these columns to the necessity for serious continuation-school work after the elementary school has been left if young artisans are to derive full benefit from technical courses later in life. It is quite clear that the gap between the day school and the technical institute must be bridged in some way if the money expended on technical instruction is to produce its best results.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society. March 26.—"Note on the Ascent of Meteorological Balloons and the Temperature of the Upper Air." By A. Mallock, F.R.S.

The recent investigation of the upper atmosphere by means of india-rubber balloons has led to the discovery that an almost constant temperature is reached when the pressure has decreased to about 150 mm. The lowest pressure reached in England is a little under 50 mm., and the corresponding height about 20 kilometres.

The note examines from a theoretical point of view what the behaviour of balloons such as are used in meteorological work must be as regards the possible heights to which they might ascend and the variations of their velocity as they rise. The determining factors are:—

(1) The relative density of the gas in the balloon and of the outer air at the same pressure.

(2) The ratio of the dead weight of the balloon and fittings to the total lifting force at ground-level.

(3) The compression, by the elasticity of the balloon, of the gas it contains.

It is shown that the velocity of the balloon at first increases as the one-sixth power of the ratio of the density of the air at the elevation attained to the density at ground-level,¹ and that when the elastic compression is small the upward velocity reaches its maximum not far from the greatest elevation to which the balloon can attain.

The results of the equations are traced in Diagram I., the values for the ratio of dead weight to lifting force and the elastic compression being such as are likely to be met with in practice. It is remarkable how rapidly the velocity decreases as the minimum pressure is approached.

To connect the pressure with the height at which it is experienced, the temperature at every point of the ascent

¹ The reason being that the decrease in density rather more than compensates for the effect of the increased cross-section.

must be known, and this information is furnished by the automatic recorder attached to the balloon.

A comparison is made between the actual temperatures and the adiabatic temperatures, *i.e.* the temperature which a given volume of dry air would have if transported from ground-level to a given height and allowed to expand without receiving or losing heat.

The height at which the pressure p is found in these circumstances is (if H =height of homogeneous atmosphere)

$$h = \frac{H}{\gamma - 1} \left(1 - m^{-\frac{\gamma - 1}{\gamma}} \right), \text{ (where } m = p/p_0 \text{), which gives}$$

a finite limit to the height of the atmosphere at 27 kilo metres nearly. The ratio of the absolute temperatures at

$$p \text{ and } p_0 \text{ is } \theta/\theta_0 = (1/m)^{\frac{\gamma - 1}{\gamma}}.$$

For isothermal expansion $dh = dH p_0/p$, and if the arbitrary relation between temperature and pressure found from the balloon records is $\theta/\theta_0 = \phi(p)$, the actual value of

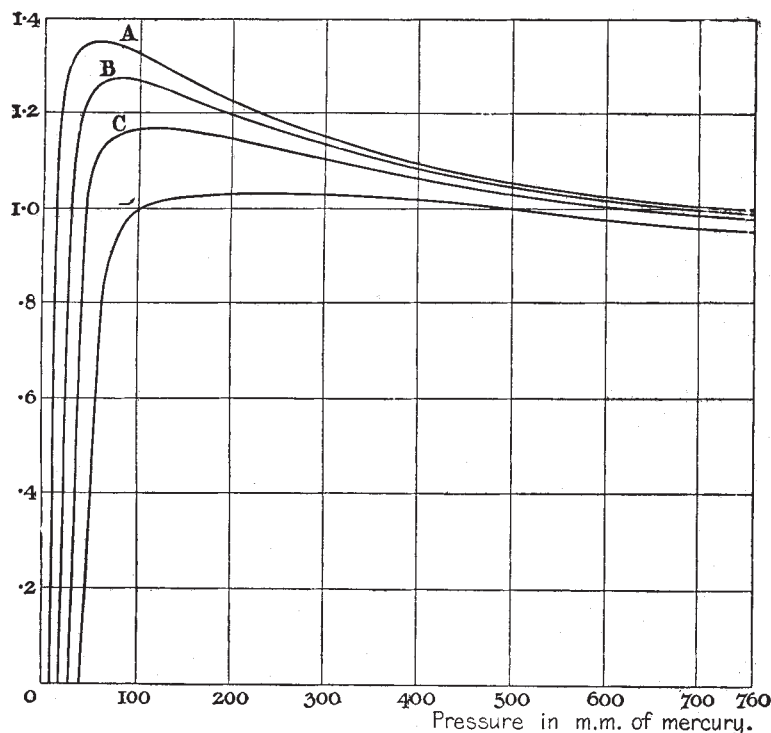


DIAGRAM I.—Velocity of ascent of balloons. The ordinates give the ratio of the velocity of a balloon in air at pressure p , carrying a load $0.6 F_0$, and with internal pressure $= p + \frac{p_0}{n} \left(\frac{p_0}{n} \right)$ being the elastic compression and F_0 the total lifting force at ground level), to the velocity at p_0 of the same balloon if devoid of weight, and with the external and internal pressures equal. For A, $n=100$; for B, C, and D respectively $n=75, 50$, and 30 .

dh is $dH \phi(p) p_0/p$, the integral of which can readily be found graphically.

The relations of the height corresponding to a given pressure on the supposition of (1) constant temperature, (2) temperature as observed, (3) adiabatic temperature are given, and it is noted that the observed decrement of temperature is almost exactly 0.7 time the adiabatic decrement down to a pressure of rather less than 200 mm., corresponding to a height of 11 kilometres.

Heights approaching 40 kilometres could probably be reached if the balloons were made more expansible, *i.e.* if the unfilled balloons were of thinner material and larger in volume than those at present in use, as this would allow of the same lifting force for the given quantity of gas and give more scope for expansion with diminished pressure.

Geological Society, May 20.—Prof. W. J. Sollas, F.R.S., president, in the chair.—Some fossil fishes discovered by Prof. Ennes de Souza in the Cretaceous formation at Ilhéos, State of Bahia (Brazil): A. S. Woodward,

F.R.S. The Lower Cretaceous formation of Bahia extends along the coast to a point 130 miles south of the area previously described. The fish remains are referable to new species of the genera *Mawsonia*, *Lepidotus*, and *Scombroclupea*. *Mawsonia* seems to have been scaleless, and differs from all known Jurassic and Cretaceous coelacanth fishes in lacking denticles on the fins. The *Lepidotus* resembles the European Wealden *L. mantelli* in proportions, but is more strongly ornamented. The *Scombroclupea* is peculiar, in exhibiting only scales where the anal finlets usually occur.—The Bala and Llandoverly rocks of Glyn Ceiriog (North Wales): Dr. T. Groom and P. Lake. The authors have mapped the district around Glyn Ceiriog on the 6-inch scale. The succession of strata is tabulated, and the characteristics of each bed given. No indication of the overlap or overstep of the Wenlock, Tarannon, and Llandoverly beds mapped by the officers of the Geological Survey or described by previous observers was found, although there is probably an un-

conformity at the base of the Fron-Frys Slates. The beds of the district dip northwards at an almost uniformly low angle, but the structure is complicated by a series of faults, most of which have hitherto escaped notice, some being very elusive. The most important east-and-west fault is the Ddolhir fault, which dips at an angle of 20° nearly with the bedding, and may be either a thrust-plane or a lag-fault. Of the N.N.W. and S.S.E. or N. and S. faults, the most remarkable is the Caemor fault, on the east side of which the rocks have been raised nearly a mile, and shifted horizontally to the south for nearly three miles.

Faraday Society, May 26.—Sir J. Swan in the chair.—*Presidential address:* Some aspects of the work of Lord Kelvin: Sir Oliver Lodge. The president commenced by pointing out the difficulty of doing justice in the course of a short address to a man who, from an early age to an old age, had turned out such a prodigious amount of work, embracing practically all branches of physical science. Lord Kelvin had calculated the age of the earth, worked in the domain of electrostatics, optics, elasticity, telegraphy, beside many other practical subjects. These, however, had been dealt with by other appreciators. Sir Oliver himself would not touch upon the practical side of Lord Kelvin's work, but upon the more recondite and abstruse branches of his activity. He was not entirely able to agree with some of Lord Kelvin's assumptions, neither did he always consider that his practical work entirely bore out his conclusions. For instance, in the case

of the kinetic theory of solidity, Kelvin seemed to consider that solids could be made from fluids and fluids from solids, and that matter might be ether in motion. But more recently he seemed to have rather changed his views, or at any rate modified them, and seemed satisfied with the postulate of action at a distance through space without the intervention of a connecting medium. Sir Oliver Lodge himself was unable to accept the explanation of action at a distance without the intermediary of some form of matter. Nothing in Lord Kelvin's work was finer than his publications in 1851, or showed the extraordinary keenness of mind aided by the tremendous natural powers which he possessed. His prescience was, at that date, even greater than that of Helmholtz. Posterity will probably consider that the greatest of all his work was that upon the conservation of energy and his enunciations upon the laws of thermodynamics. This part of the discussion was illustrated on the blackboard by mathematical formulæ. Reference was also made to

the importance of his work upon absolute measurements, and Sir Oliver Lodge pointed out that some persons appeared to think that absolute measurements meant the metric system, but it did not matter in the least what units were employed so long as they were understandable.

Zoological Society, May 26.—Prof. E. A. Minchin, vice-president, in the chair.—Mammals collected by Mr. C. H. B. Grant near Tette, Zambesia, being the tenth and last of the series of papers on Mr. C. D. Rudd's exploration of South Africa: Oldfield **Thomas** and R. C. **Wroughton**. The importance of this collection was due to the fact that Tette was the place where Dr. Peters obtained most of the specimens on which his "Säugethiere von Mossambique" (1852) was based, and the specimens now collected were therefore topotypes of his species, and in consequence of great value in working out South African mammals in general; 104 specimens were referred to, belonging to thirty-two species. The exploration had lasted five years, and its results formed the largest and most complete collection that the National Museum had ever received from any one source. Besides duplicates, 1541 specimens had been registered in the museum, a large number of new species and subspecies had been discovered and described, and many more old and inaccurately described species were now represented by good series of well-prepared skins and skulls. The collection had, in fact, revolutionised our knowledge of South African mammalogy, and it was impossible to exaggerate the benefit that such an exploration was to zoology in general and to the National Museum in particular.—The small collection of terrestrial Isopoda made by Dr. Cunningham on the third Tanganyika expedition: Rev. T. R. R. **Stobbing**. The collection consisted of four species. For two of these the author instituted the new genus *Anchiphiloscia*, distinguished by more penicils on the mandibles and a different cleavage of the second maxillæ from *Philoscia* as founded by Latreille in 1804. The paper insisted on the need of some enthusiast able and willing thoroughly to revise all the forms which had clustered under and about the generic name *Philoscia*.—The anatomy of *Antechinomys* and some other marsupials, with special reference to the intestinal tract and mesenteries of these and other mammals: F. E. **Beddard**. With the aid of a series of diagrams, the author described four grades or types into which he divided the modes of suspension of the mammalian intestinal tract.—The dermal armour of the extinct reptiles of the genus *Pareiasaurus*: Prof. H. G. **Scoley**. The existence of a dermal armour in *Pareiasaurus* had been doubted by some authors, but Prof. Scoley was able to exhibit some actual specimens of scutes which had been obtained by Mr. J. Van Renen south of Fraserberg, Cape Colony.—Prof. **Scoley** also exhibited the skull of an extinct reptile of the genus *Diademodon*, on which he proposed to found a new species, and gave an account of the further evidence which it afforded of the structure and dentition of these South African reptiles.—Descriptions of many new species of Siphonaptera: Hon. N. Charles **Rothschild**.

DUBLIN.

Royal Dublin Society, May 19.—Prof. Young, F.R.S., in the chair.—Mendelian characters among Shorthorn cattle: Prof. J. **Wilson**. The author showed that in the matter of colour Shorthorn cattle display Mendelian phenomena, and that the reds and whites are the parent races, while the roans are intermediate hybrids. In support of this he quoted data collected for another purpose by Miss Barrington and Prof. Karl Pearson, which were published in *Biometrika* (vol. iv.). For the purpose of his paper the author pointed out that Barrington and Pearson's data were not complete, inasmuch as they left out of account several factors that cause the registration of Shorthorn cattle to be inaccurate. The author collected new data, in which the inaccuracies are eliminated as far as possible. He also gave a short account of the origin of Shorthorn cattle and of the history of the three races of cattle now found in the British Isles, viz. the black Celtic race, the white Roman race, and the red Saxon race.—Injurious insects and other animals observed in Ireland during the year 1907: Prof. G. H. **Carpenter**. The paper included records of

several insects feeding on tobacco, including the caterpillars of *Mamestra oleracea* and *M. brassicae*, and a springtail—*Isotoma tenella*, Reuter—new to the Britannic fauna. The storehouse beetle, *Ptinus tectus*, Boield., lately introduced into Great Britain, has now appeared also in the suburbs of Dublin.

PARIS.

Academy of Sciences, June 1.—M. H. Becquerel in the chair.—The fossils of Patagonia. Economy in nature: Albert **Gaudry**. A comparison of the remains of mammals of the Patagonian region with those of this hemisphere shows no reason for supposing that there were two centres of creation; but during Tertiary times evolution has taken place in the two hemispheres differently, continuing in the one and being arrested in the other.—New observations on Etna: A. **Lacroix**. The eruption has been studied from the observatory, situated at an altitude of 2942 metres, and at the foot of the terminal cone, 1 kilometre from the crater. The clouds emitted are compared with those of Mont Pelée, and details are given of the field within which fresh openings have been produced, and of the materials projected by the explosions of the central crater.—Some points relating to the pathogeny of congenital deformities of the face: M. **Le Dentu**. A general review of the theories of malformation is given, the statistics relating to the influence of heredity being considered in some detail.—The stability of auto-excited alternators working in parallel: M. **Dumoulin**. A study of the effect of adjusting the brushes of the rectifier supplying the inducing current.—Two different states of the iron arc: H. **Buisson** and Ch. **Fabry**. The first state of the arc, which is stable only when the current is intense, can be made to pass over into the other by introducing a large resistance into the circuit, the electromotive force being high, 220 to 440 volts. The phenomena observed are compared with those shown by the arc between carbon poles.—The hydrates of the fatty acids determined from measurements of the viscosity of their solutions: D. E. **Tsakalotos**. These measurements lead to the conclusion that there is no combination between formic acid and water, whilst acetic, propionic, and butyric acids form molecular combinations containing one molecule of water to one molecule of the acid.—The action of ammonia upon phosphorus chloronitride: MM. **Besson** and **Rosset**. With dry liquid ammonia the product of the reaction is $\text{PN}(\text{NH}_2)_2$; gaseous ammonia acting on a solution of the chloronitride in carbon tetrachloride gives a different substance,



soluble in carbon tetrachloride.—The acid phosphoric esters of guaiacol: V. **Auger** and P. **Dupuis**.—The mechanism of cyclic formation in the geranic series; the synthesis and structure of dihydromyrcene: M. **Tiffeneau**.—Researches on protoplasmic hydrolysis: A. **Étard** and A. **Vila**. It is pointed out that the current methods of separating and determining the nitrogenous products of the hydrolysis of protoplasmic substances entail unavoidable losses.—The relations between the microgranites and the diabases of the Meuse valley: J. **de Lapparent**. It is concluded that the eruption of the microgranites of the valley of the Meuse is of a later date than that of the diabases. At the moment of the eruption of the microgranites the magma of the diabases had not consolidated.—A new genus, *Lecythodytes paradoxus*, a parasite of the Chrysomonadinæ: P. A. **Dangeard**.—The propagation of some species of mosses of the genus *Barbula* under certain experimental conditions: Jacques **Maheu**.—The pallial defensive glands in *Scaphander lignarius*: Rémy **Perrier** and Henri **Fischer**.—The most recently discovered drawings in the Portel (Ariège) grotto: A. **Breuil**, L. **Jammes**, and R. **Jeannel**. In a branch of the main cavern, unnoticed until recently, a fresh set of palæolithic drawings has been found. These include pictures of a small bison and a horse, reindeer, and wild goat. Evidence of the presence of small bears in this cave has also been found.—The entoptoscope, an instrument for examining the macula: Paul **Fortin**.—Radioscopy in forensic medicine: F. **Bordas**. In determining whether an infant has breathed or not, radiography cannot be substituted for the methods in current use. It is, however, of service in

furnishing the expert with a photographic document, which may be used as supplementary evidence.—A new thermopulveriser worked by means of compressed air: M. **Guyenot**. The various forms of apparatus in current use for producing sprays of aqueous solutions for therapeutic purposes cannot be used for a higher temperature than 25° C. In the apparatus described and figured in the present paper, any temperature up to 50° C. can be maintained at will.—Researches on the food of the typhoid bacillus: H. **Dunschmann**. A comparison of the nutritive effects of bile salts on the typhoid and coli bacilli.—The utilisation of concentrated saline solutions for the differentiation of bacteria. The separation of *Bacillus typhosus* from *Bacterium coli*: A. **Guillemand**. A strong saline solution, such as one containing 20 per cent. of sodium sulphate, causes differences in the growth of cultures of the typhoid and coli bacilli, by means of which they can be readily differentiated. Other bacilli have been studied from the same point of view.—The presence of Hippurite grit at Vence, Alpes-Maritimes: V. **Paquier**.—The Cretaceous and Tertiary strata in the region of Constantine, Algeria: E. **Joleaud**.—The use of Daguin's *acoustèle* for the detection of subterranean sounds: F. **Diéniert**, A. **Guillerd**, and M. **Marrec**. An account of the application of this instrument to the tracing of currents of underground water by means of the sound produced by the stream. The method is only successful in a few limited cases.—The influence of the wind on the filling up of the bed of the ocean: M. **Thoulet**.—Contribution to the study of the Landwasser river and the Davos valley: Gabriel **Eisenmenger**.

DIARY OF SOCIETIES.

THURSDAY, JUNE 11.

MATHEMATICAL SOCIETY, at 5.30.—Electrical Resonance: Prof. H. M. Macdonald.—Relations between the Divisors of the First n Numbers (second paper): Dr. J. W. L. Glaisher.—The Formation of Fundamental Harmonics: Prof. A. E. H. Love.

FRIDAY, JUNE 12.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Considerations on the Form and Arrangement of New Tables of the Moon: Simon Newcomb.—On the Orbit of β 416: J. Voute.—An Example of Prof. Karl Pearson's Calculation of Correlation in the Case of Periodic Inequalities of Long Period Variables: H. H. Turner.—On the Parallax and Proper Motion of the Double Star Krueger 60: E. E. Barnard.—Observations of Daniel's Comet (d 1507): Radcliffe Observatory, Oxford.—The Lunar Bright Rays: H. G. Tomkins.—Observations of Helium D₃ Absorption in the Neighbourhood of Spots in 1907: Capt. R. A. C. Daunt.—The Radius of the Moon for Libration $-4^{\circ}5'$: Walter Heath.—*Probable paper*: Report on Observations of the Total Solar Eclipse of 1908 January 3: F. K. McClean.

ARISTOTELIAN SOCIETY (at Cambridge).—Symposium: The Nature of Mental Activity: Profs. S. Alexander, James Ward, Carveth Read, and G. F. Stout.

PHYSICAL SOCIETY, at 8.—Experiments on a Directive System of Wireless Telegraphy: Messrs. Bellini and Tosi.—On the Lateral Vibration and Deflection of Clamped Directed Bars: Dr. Morrow.—On the Resistance of a Conductor of Uniform Thickness whose Breadth Suddenly Changes, and on the Shapes of the Stream-lines: Prof. Lees.—On the Self-inductance of Two Parallel Wires: Dr. Nicholson.—On Homogeneous Secondary Radiation: Dr. Barkla and Mr. Sadler.—Notes on the Motion of a Corpuscle and on Cloud Formation: Prof. Morton.

GEOLOGISTS' ASSOCIATION, at 8.—Origin of Mountain Tarns: Prof. E. J. Garwood.

MONDAY, JUNE 15.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Journey on the Upper Salwin: George Forrest.

TUESDAY, JUNE 16.

ROYAL STATISTICAL SOCIETY, at 5.

ZOOLOGICAL SOCIETY, at 8.30.—The Duke of Bedford's Zoological Exploration of Eastern Asia.—X. List of Mammals from the Provinces of Chih-li and Shan-si, N. China: Oldfield Thomas, F.R.S.—On a Case of Imperfect Development in *Echinus esculentus*: James Ritchie and D. C. McIntosh.—Observations on the Minute Structure of the Spicules of Calcareous Sponges: Prof. E. A. Minchin and D. J. Reid.—Two New Genera and a New Species of Indian Lycanidae: Dr. T. A. Chapman.—A Contribution to the Knowledge of *Rhinoderma darwini*: F. E. Beddard, F.R.S.—Some Notes upon the Anatomy of *Charomys madagascariensis*, with References to other Lemurs: F. E. Beddard, F.R.S.—*Leucocytozoon musculi*, sp. n., a Parasitic Protozoon from the Blood of White Mice: Miss Annie Porter.

MINERALOGICAL SOCIETY, at 8.—On a Nickel-iron Alloy Common to the Meteoric Iron of Youndegin and the Meteoric Stone of Zomba: L. Fletcher, F.R.S.—Kaolinization and other Changes in West of England Rocks: F. H. Butler.—On Schwartzbergite, and the Drawing of Light Figures: Dr. G. F. Herbert Smith.—The Chemical Composition of Seligmannite: Dr. G. T. Prior.

WEDNESDAY, JUNE 17.

GEOLOGICAL SOCIETY, at 8.

ROYAL METEOROLOGICAL SOCIETY, at 4.30.—An Elementary Explanation of Correlation, Illustrated by Rainfall and Depth of Water in a Well: R. H. Hooker.—The Hong Kong Typhoon, September 18, 1906: L. Gibbs.

ROYAL MICROSCOPICAL SOCIETY, at 8.—On Cyclococulina, a New Generic Type of the Foraminifera: E. Heron-Allen and A. Earland.—Illuminating Apparatus for the Microscope: J. W. Gordon.—*Exhibits*: A New Lens for High Power Microscopy: Mr. Gordon and H. Fletcher Moulton.—The Development of the Chick: A. Flatters.

THURSDAY, JUNE 18.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: (1) An Electrical Method of Counting the α Particles from Radio-active Matter: (2) The Charge and Nature of the α Particles: Prof. E. Rutherford, F.R.S., and Dr. Hans Geiger.—The Scattering of the α Rays by Matter: Dr. Hans Geiger.—Studies of the Processes Operative in Solutions. Part VI. Hydration, Hydrolysis, and Hydrolysis as Determinants of the Properties of Aqueous Solutions: VII. The Relative Efficiencies of Acids as deduced from their Conductivities and Hydrolytic Activities: VIII. The Influence of Salts on Hydrolysis and the Determination of Hydration Values: IX. The Determination of Optical Rotatory Power in Solutions: X. The Changes Effected by the Reciprocal Interference of Cane Sugar and other Substances (Salts and Non-electrolytes): Prof. H. E. Armstrong, F.R.S., and others.—The Electrolytic Properties of Dilute Solutions of Sulphuric Acid: W. C. D. Whetham, F.R.S., and H. H. Paine.—The Giant Nerve Cells and Fibres of *Halla parthenopeia*: Dr. J. H. Ashworth.

CHEMICAL SOCIETY, at 8.30.—The Thermal Decomposition of Hydrocarbons, Part I. Methane, Ethane, Ethylene and Acetylene: W. A. Bone and H. F. Coward.—The Rusting of Iron: W. A. Tilden.—Studies on Elementary Zirconium: E. Wedekind and S. J. Lewis.—(1) The Constituents of Canadian Hemp, Part I, Apocynin; (2) A New Synthesis of Apocynin: H. Finckemore.—The Constitution of the Diazonium Perbromides: F. D. Chattaway.—Cholestenone: C. Dorée and J. A. Gardner.—A New Form of Potash Bulb: A. E. Hill.—Solubility of Silver Chloride in Mercuric Nitrate Solutions: B. H. Buttle and J. T. Hewitt.

LINNEAN SOCIETY, at 8.

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